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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/586,712

07/20/2006

Masahiro Yasumi

MAT-8867US

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7590

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EXAMINER

ROSENAU, DEREK JOHN

ART UNIT

PAPER NUMBER

2837

MAIL DATE

DELIVERY MODE

07/09/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/586,712 | Applicant(s) YASUMI ET AL. | |
| | Examiner Derek J. Rosenau | Art Unit 2837 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 April 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings were received on 30 April 2009. These drawings are accepted.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. (WO 2003/052840) in view of Watanabe et al. (US 6153898) and Yao et al. (US 2007/0164634).

4. With respect to claim 1, Fujii et al. discloses an angular velocity sensor (Fig 15) comprising: a substrate (item 500) made of single crystal silicon (Paragraph 217) and having a tuning fork shape (Fig 15), the substrate including a plurality of arms extending parallel with each other (Fig 15), and a joint section for connecting respecting ends of the arms with each other (Fig 15); a first adhesion layer (Fig 1, item 12) provided on the substrate (Fig 1), the first adhesion layer containing titanium (Paragraph 71); a first electrode layer (item 503) provided on the first adhesion layer (Fig 16), the first electrode containing at least one of titanium and titanium oxide (Paragraph 19); an orientation control layer (item 504) provided on the first electrode layer (Fig 16) a piezoelectric layer (item 505) provided on the orientation control layer (Fig 16); and a second electrode layer (item 506) provided on the piezoelectric layer (Fig 16).

Fujii et al. does not disclose expressly a barrier layer provided on each of the plurality of arms of the substrate, the barrier layer containing silicon oxide; the first adhesion layer being provided on the barrier layer, or a second adhesion layer provided on the piezoelectric layer with the second electrode being formed on the second adhesion layer.

Watanabe et al. teaches a piezoelectric device including a barrier layer (item 12) provided on the substrate (Fig 1), the barrier layer containing silicon oxide (column 3, lines 51-60); the adhesion layer (item 13) being formed on the barrier layer (Fig 1).

Yao et al. teaches a piezoelectric device in which an adhesion layer is provided between the piezoelectric layer and the top electrode layer (Paragraph 56); therefore, Yao et al. discloses a second adhesion layer provided on a piezoelectric layer and a second electrode provided on the second adhesion layer.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the barrier layer of Watanabe et al. and the second adhesion layer of Yao et al. with the angular velocity sensor of Fujii et al. for the benefits of preventing diffusion (column 3, lines 51-60 of Watanabe et al.) and to improve the bond between the piezoelectric layer and the top electrode (Paragraph 56 of Yao et al.).

5. With respect to claim 2, the combination of Fujii et al., Watanabe et al., and Yao et al. discloses the angular velocity sensor of claim 1. Fujii et al. discloses that the orientation control layer comprises dielectric oxide material containing Pb and Ti (Paragraph 73)

Art Unit: 2837

6. With respect to claim 3, the combination of Fujii et al., Watanabe et al., and Yao et al. discloses the angular velocity sensor of claim 1. Fujii et al. discloses that the orientation control layer comprises lead titanate containing at least one of La and Mg (Paragraph 73).

7. With respect to claim 4, the combination of Fujii et al., Watanabe et al., and Yao et al. discloses the angular velocity sensor of claim 1. Fujii et al. discloses that the piezoelectric layer comprises lead zirconate titanate (Paragraph 230).

Response to Arguments

8. Applicant's arguments filed 30 April 2009 have been fully considered but they are not persuasive. Applicant argues that Yao et al. does not qualify as prior art, as its earliest possible publication date is 23 October 2005, which is after the foreign priority of the present application, which is 23 February 2005. First, the foreign priority has not been perfected. Second, the effective filing date of the Yao et al. Reference is the filing date of the PCT application. The PCT application was filed after 29 November 1999, published in English, and designated the United States; therefore, the effective filing date and 102(e) of Yao et al. is 23 April 2004. As the 102(e) date of Yao et al. is before the foreign priority date of the present application, Yao et al. would remain prior art even if the priority is perfected.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is (571) 272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Benson can be reached on (571) 272-2227. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2837

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Derek J Rosenau/

Examiner, Art Unit 2837

/Walter Benson/

Supervisory Patent Examiner, Art Unit 2837